In the Specification:

Page 14, line 29 - page 15, line 6:

The device of the invention can be secured to the limb, e.g. arm, by means of a brace (92). The brace(92) may comprise besides a lower arm support (3) for supporting the lower arm of a user, also an upper arm support (4) for supporting the upper arm of a user. The lower arm support is attached to the upper arm support (4) by a hinge (5).

Flexible positioning means can be used for positioning the brace (92) and the motor unit on the body of a person carrying the device in a stable position. For example, the positioning means (7) can be an inflatable housing of flexible material provided with a hip fastening means ~~(12)~~ (22) (Figure 6). The housing allows at least partial deformation when it is fastened on a body for providing a stable position. Due to its specific arrangement, the device has the advantage of not sliding form its optimum position to the back of the human body, a disadvantage that occurs in many of the known prior art systems.

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In another preferred embodiment the portable device according to the invention comprises a device wherein the lower arm support (3) is adjustable in order to fit the length of the upper and the lower arm of a user. The target group for use of the device of the invention mainly consists of adult men and women of the 5% to 95% ergonomic groups. As a consequence it is preferable that the device of the invention is adjustable to every such patient. Several features of the device enable the independent adjustment and personalisation of the brace (92). For example, the arm members are fixed on the plastic support structures by means of simple straps on (12). The plastic support structures can be adjusted in position to fit the upper and lower arm. The position of the hand support versus the lower arm support can be adjusted lengthwise. Consequently, the device is comfortable from a patient's point of view and is easy to apply. Additionally, the arm and shoulder brace is adjustable for a patient's length, body and anatomy and is adjustable with respect to speed and range of motion. All these features allow the device of the invention to be independently adjustable for use with either shoulder. Also, as mentioned above, the positioning means of the device consists of an inflatable housing of flexible material provided with a hip fastening means, e.g. a belt, said housing allowing at least partly deformation when fastened on a body for providing a stable position.

Optionally, in another embodiment, the portable device according to the invention may further comprise belts provided with fasteners. The weight of the arm and the overall mechanical system of the device itself is supported by the positioning means, e.g. an inflatable air chamber (7). The inflatable air chamber (7) is kept in place with relation to the patient's body by means of a hip belt and optional belts with simple fasteners, e.g. Velcro. The fact that the positioning means consists of a flexible material involves several advantages. The positioning means is deformable under the weight of the brace and motor mechanism thereto connected. Also, it can easily adapt to the anatomy of a patient carrying the device. Furthermore, it can take in a comfortable position along the torso of a patient carrying the device.

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c) If both wrist (1) and elbow (2) are moved at the same time but in opposite directions, this is called complex rotation movement of wrist (1) and elbow (2). The drive mechanism that enables the movement of the points of control is preferably located in the zone between the mechanical support of the arm, i.e. the primary sub-frames with plastic support structures, and the air chamber, as indicated on figure 6. In another embodiment, the secondary sub-frame linking both points of control has a mechanical transition (14) to a primary sub-frame. The connection between the secondary sub-frame and the primary sub-frame is provided by the mechanical interface (14), which is e.g. a hinge-like structure along the vertical axis, located at the patient's elbow. An illustration of an embodiment wherein the support of the lower arm is connected by a mechanical interface to a secondary sub-frame is provided in figure 7. The motor mechanism used in order to ensure abduction/adduction and rotational movements by the device of the current invention can be any type of mechanism that allows controllable movement of the two control points. This movement control can be performed by e.g. a set of inflatable air chambers, whereby two separate inflatable air chambers can allow movement of the two control points. In this case an air pump or compressor is necessary in combination with separate inflatable air chambers or with air pressure pistons. Alternatively, the controllable movement of the two control points can be performed by spindles, linear actuators or mechanical piston systems. Preferably this is performed using spindles driven by a motor unit being an electromotor allowing vertical movements of the actuators 30. Preferably two motor units are provided in the motor mechanism, whereby one motor unit or first unit is provided for the wrist point of movement control and the other unit

or second unit is provided for elbow point of movement control. Both motor units induce movements in a vertical direction. This vertical direction is referred to the axial direction of the motor unit, as can be seen on figure 6 and figure 8, not to e.g. the median axis of the body. In a particular embodiment, the invention relates to a portable device, wherein the first and second motor unit consists of a triple spindle (90) with electromotor with worm wheel transfer (91), being provided in a housing, allowing the motor units to induce a vertical movement of the actuators (30). Parallel extension of the two motor units in this case allows performing adduction/abduction movement, while extension of only one motor unit or unequal or non-equivalent extension of the two motor units allows performing rotation movements. The strength of the motors used is adjusted so that they can deliver sufficient power to allow vertical movement of the extending actuators under the pressure of the limb resting on the motor units.

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A particular embodiment of the motor mechanism in accordance with the present invention is further illustrated on figure 8. The motor-driven sliding mechanism is located in a housing (14), and connected, via a secondary sub-frame (15), with the control point of elbow (2). A bellows structure (6) may be provided to protect the motor mechanism and to improve safety of the brace user. One motor unit, i.e. the first unit (8) is provided which controls the wrist movement ~~(8)~~ and another motor unit, i.e. the second unit (9) controls the elbow movement. In addition, a foam block (16) is optionally provided at the height of the hip. This block provides additional mechanical protection for a user of the device according to the invention and also provides protection for the air chamber unit of the device. The foam block avoids stress points on a user, which may be caused by contact of the user with the device according to the invention. The mechanical concept of the endo/exo rotation sliding mechanism is shown on figure 5, which gives a detailed view on the relation between the sliding movement of the lower arm (17) and the compensating rotation movement (18) during the exo/endo rotation. The sliding mechanism, i.e. conduction of the lower arm support (3) according to arrow 17, is combined with a rotation point near the height of the elbow point of movement control, according to arrow 18.

In a particular embodiment, the motor units for the control points near the wrist (1) and elbow (2) consist of a triple spindle (90) with electromotor, which are mounted in a plastic

housing. The motor units have compact electromotors with worm wheel transfer (91). This concept enables controlled movements that are stoppable at any point. Furthermore spindles with electromotors have the advantage that they are quite silent, they are relatively cheap and the speed of the device is easily controllable. Therefore, the device of the invention allows movements of the limbs to be performed in a controllable and preferably in an automated way.